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Original Article

Outcomes of Palliative Care Team Consultation for Ventilator Withdrawal from Terminally Ill Patients in the Intensive Care Unit☆

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SUMMARY

Background: The Hospice Palliative Care Act in Taiwan was amended and allowed families to withdraw life-sustaining treatment for unconsciousness terminally ill patients. However, ventilator withdrawal in the intensive care unit (ICU) is still a challenge. We designed this retrospective observational study to evaluate the outcomes of palliative care withdrawal from terminal patients in the ICU.
Methods: We retrospectively collected data from patients who had consulted the palliative care team for ventilator withdrawal in the ICU. In a 2-year period, between 2013 and 2014, we reviewed the consultations in the surgical and medical ICU of a medical center.
Results: There were 103 consultations for palliative care withdrawal in the ICU during 2013–2014. Thirty-seven patients who died within 72 hours after palliative care withdrawal were analyzed. The time to consult the palliative shared care team after admission to the ICU was significantly related to patients who had experienced the procedure of cardiopulmonary resuscitation. The time to death after ventilator withdrawal was significantly related to whether "do not resuscitate" had been written. Other factors were not significantly related to the survival time after ventilator removal.
Conclusion: In our study, ventilator withdrawal is more acceptable for intensive-care physicians when cardiac arrest had happened previously, and late referral for palliative care is frequently in the ICU. The survival time after ventilator removal was not shorter for those with do not resuscitate status. For the purpose of better end-of-life care, the promotion of education for palliative care is necessary.

Introduction

The Hospice Palliative Care Act was passed in Taiwan in 2000. The Act allows terminally ill patients to choose their treatment policy when death is approaching, especially for "do not resuscitate" (DNR). The incidence of cardiopulmonary resuscitation (CPR) decreased for terminally ill patients in Taiwan after the Act was passed[1]. The Act was amended three times, and finally allowed for families to withdraw/withhold life-sustaining treatment for unconsciousness terminally ill patients[2].

Since the most critically patients are admitted to the intensive care unit (ICU), death often occurs there[3,4]. The goal of the ICU is to save lives, but the lack of palliative care training for most intensive-care physicians means that the issues related to withholding and withdrawing treatment have more challenge in the ICU[5]. Since many of the patients placed on ventilators in the ICU may not have had formal advance directives already in place, palliative care services often help the patients whose decisions for end-of-life care are usually unknown and whose families are reluctant to make decisions about end-of-life care. In Taiwan, consultation with the palliative share care team can offer its services to terminally ill patients admitted from hospice wards. Involvement of the palliative care team, with adequate information for the patients and families, can help improve the process of withholding/withdrawing life support[6,7].

We carried out a retrospective study to establish the factors involved in the relationship between the palliative ventilator withdrawal and death of terminally ill patients in the ICU.

Materials and Methods

We retrospectively collected data from patients who had consulted the hospice shared care team for the purpose of ventilator

☆ Conflicts of interest: All contributing authors declare that they have no conflicts of interest.

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withdrawal in the ICU. In a 2-year period, between January 1, 2013 and December 31, 2014, the consultations in the surgical and medical ICU of a medical center were reviewed. The hardcopy records of the palliative shared care team and the electronic medical and nursing records of the ICU were reviewed. Data collection included age, gender, admitting diagnosis, DNR status before and after consultation, time to death after ventilator withdrawal, time to consultation after ICU admission, and significant comorbid conditions that met the criteria of terminal disease that are listed in the Hospice Palliative Care Act, such as cancer, liver cirrhosis, and advanced respiratory, neurological, renal, and cardiovascular disease. Because most critically ill patients were unable to participate in making the decision for ventilator withdrawal, families and caregivers were generally asked to participate.

Some patients were transferred to the ICU because of cardiac arrest and restoration from CPR, and additional data were recorded for patients who experienced this procedure. The study method was reviewed by the Institutional Review Board of Mackay Memorial Hospital, Taipei, Taiwan (16MMHIS030).

We were interested in the relationship between ventilator withdrawal and death, but we could not establish the real relationship between them when the patients were alive for > 3 days after withdrawal. This was because the death of patients may have been related to other causes, for example, serious infection. For that reason, those whose survival was > 3 days after ventilator withdrawal were excluded. An independent-sample *t* test was used to identify factors associated with palliative withdrawal of mechanical ventilation.

Results

There were 103 consultations for palliative ventilator withdrawal in the ICU during 2013–2014. All of them were for terminally ill patients, as defined by the Hospice Palliative Care Act. They all had serious injury or illness and were diagnosed by physicians as incurable, and there was medical evidence to show that their prognosis was fatal in the near future. Although all the patients were terminally ill, nine of them did not meet the criteria listed in the Hospice Palliative Care Act for ventilator withdrawal. Four patients (3%) survived after ventilator withdrawal and were discharged from the ICU. There were 32 patients (31%) whose families could not achieve unanimous consensus and failed to withdrawal the ventilator.

We analyzed 37 patients who died within 3 days after palliative ventilator withdrawal. The average age for the study population was 73.05 years, and 65% were male. Eighty-nine percent of patients/families had written consent for DNR before consulting the palliative care team. The average time to consult the palliative care team after ICU admission was 17.65 days. There were eight patients (22%) who had experienced cardiac arrest and successful CPR. Among these patients, 10 (27%) had more than three kinds of comorbid diseases (Table 1).

An independent-sample *t* test was used to identify factors associated with palliative withdrawal of mechanical ventilation. The time to consult the palliative shared care team after admission to the ICU was significantly related to whether patients had experienced CPR ($p = 0.002$). The survival time after withdrawal was significantly related to DNR status when the palliative care team was consulted ($p = 0.001$). Other factors were not significantly related to survival time after ventilator removal. The statistical results are shown in Table 2.

Discussion

Among life-sustaining treatments, withdrawal of the ventilator or endotracheal intubation is the most disputed decision for families and/or physicians. Although the ethical and legal position in respect of ventilator withdrawal does not cause death, death may occur quickly after withdrawal. For that reason, the families and physicians may conclude that withdrawal causes death and is more akin to euthanasia. Most bioethicists claim that withholding and withdrawal of life-support measures are ethically equivalent, but in our study, nine patients' families preferred to withhold other life-sustaining treatment such as Intravenous infusion (IVF) or hemodialysis rather than withdraw the ventilator. It is a culture difference that withdrawal is more difficult to accept by the caregiver in Taiwan[8].

There were almost one-third of patients (31%) whose families refused palliative ventilator withdrawal. The most important reason for refusal was that withdrawal would result in death. In the report of Smedira et al[9], 91% ($n = 106$) of families of critically ill patients agreed for withdrawal or withholding life-support treatment. This result is different from ours and may be related to the different culture and tradition. In fact, cultural differences and the lack of guidelines and official statements could explain the ethical limitations of the decision-making process[10]. However, since palliative care can provide better quality of life for terminal patients, further education about palliative care for patients and families should be promoted[11].

In our study, the time to consult the palliative shared care team after admission to the ICU was significantly related to whether patients received CPR. The median time to consultation for the two

Table 1
Characteristics of patients.

Male:female	24:13
Average age (y)	73.05
Time to death after ventilator withdrawal (h)	11.18
DNR status at consultation	
Yes	33
No	4
Time of consultation after ICU admission (d)	17.65
OHCA/IHCA (*n*)	8
Comorbid disease (*n*)	
Cancer	11
Liver cirrhosis	2
Respiratory	10
Neurological	15
Renal	14
Cardiovascular	18

DNR = do not resuscitate; ICU = intensive care unit; IHCA = In-Hospital Cardiac Arrest; OHCA = Out-of-Hospital Cardiac Arrest.

Table 2
Factors associated with time to death after ventilator withdrawal and time of consultation after ICU admission.

Factors	Time to death after ventilator withdrawal	Time of consultation after ICU admission
	p	*p*
DNR status at consultation	0.001	0.332
Comorbid disease		
CNS	0.217	0.316
Cardiovascular	0.78	0.957
Lung	0.788	0.115
Kidney	0.742	0.868
Liver	0.5	0.418
Cancer	0.317	0.297
Aspiration PN	0.217	0.131
OHCA/IHCA	0.091	0.002

CNS = central nervous system; DNR = do not resuscitate; ICU = intensive care unit; IHCA = In-Hospital Cardiac Arrest; OHCA = Out-of-Hospital Cardiac Arrest.

groups was 5.13 days and 21.10 days, respectively. This result indicates that palliative ventilator withdrawal is more acceptable for intensive-care physicians when the patients' condition is poor and frail due to cardiac arrest. A similar experience was reported by Fumis and Deheinzelin[12]. They found that when the patients were incompetent, physicians were significantly less prone to propose decisions regarding withdrawal of ventilator support[12].

From another perspective, we found that if cardiac arrest did not happen, late referral for palliative care was frequently in the ICU. This opinion was also mentioned by Morita et al[13]. Palliative care was associated with significantly lower likelihood of ICU use and lower inpatient costs compared to medical wards. Palliative care services can provide better quality of life and decrease the cost of care for terminal patients[14]. In the experience of the University of Rochester Medical Center (Rochester, NY, USA), investigators concluded that a significant reduction in ICU length of stay was found in the consultation group[15]. Better patient and family outcomes with palliative care suggest a cost and quality incentive for hospitals to develop palliative care programs. Promotion of consultation about palliative care for terminally ill patients in the ICU is necessary.

As mentioned above, the goal of ICU care is to save lives, and sometimes patients and families hesitate to sign for DNR. They are afraid that DNR is equal to abandoning treatment. Another finding of our study was the relationship between survival time after ventilator removal and DNR status when the palliative care team was consulted. For patients who did not sign the form for DNR, the median survival time after ventilator removal was 0.31 hours. In another group, it was 12.54 hours. This result may need further investigation because of the small sample size for those who did not sign DNR ($n = 4$). However, we can conclude that the survival time after ventilator removal was not shorter for those who signed DNR. Other study have shown that palliative care does not shorten the life of terminal patients[16]. This finding addressed concerns about DNR for patients and families when we discussed this issue with them.

Huynh et al[17] reported that the fraction of inspired oxygen > 70% and a requirement for vasopressors were associated with shorter time to death. Being in the neurology/neurosurgical service at the time of ventilator withdrawal was associated with a longer time to death[17]. In our study, we did not confirm the significant factors related to the time to death after palliative ventilator withdrawal. This may be related to the retrospective nature of the study and some factors were not recorded on the medical charts. Kirchhoff et al[18] demonstrated that the comprehensive documentation of end-of-life care is lacking in the United States. It is a problem that when aggressive treatment is ceased, most of the medical records of chart about terminal care are rough. Documentation for terminally ill patients with ventilator withdrawal should be improved, and a further, randomized study should be designed to confirm other factors about the relationship between the withdrawal and survival.

Our method to evaluate palliative ventilator withdrawal in the ICU had some limitations that may have influenced the interpretation of our results. First, it was a retrospective observational study, and the documentation about the status of terminal patients was not uniform. For example, there was a lack of recording fraction of inspired oxygen in some patients before ventilator withdrawal. Lack of these data may have interfered with the result. Second, this study was only conducted in a single hospital. The level of palliative care training skills of ICU physicians differs among hospitals, and the attitude of ICU physicians may have been biased by their level of knowledge. A large, randomized multicenter study should be designed for further investigation.

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